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<u>L17</u> dependency adj structure adj matrix and genetic adj operator.clm.	1	<u>L17</u>
<u>L16</u> design adj structure adj matrix and genetic adj operator.clm.	1	<u>L16</u>
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<u>L15</u> dependency adj structure adj matrix and genetic adj operator.clm.	1	<u>L15</u>
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<u>L11</u>	706/\$.ccls.	8127	<u>L11</u>
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<u>L8</u>	goldberg-david-e.in.	9	<u>L8</u>
<u>L7</u>	L5 and genetic adj operator	1	<u>L7</u>
<u>L6</u>	L4 and genetic adj operator	1	<u>L6</u>
<u>L5</u>	dependency adj structure adj matrix	6	<u>L5</u>
<u>L4</u>	design adj structure adj matrix	12	<u>L4</u>
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### Methods and program products for optimizing problem clustering ...

A method for optimizing clustering in a **design structure matrix** comprising the steps of: applying at least one **genetic operator** to a parent population of ...

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### Methods and program products for optimizing problem clustering ...

An embodiment of the present invention includes the steps of using a **genetic operator** to achieve an optimal clustering of a **design structure matrix** model.

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### [PDF] A Generic Genetic Algorithm for Product Family Design

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(1999) apply a **design structure matrix** to cluster highly ... hybrid strategy applies rejecting, penalty strategies, and modifying **genetic operator** strategy ...

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... of the workflow model and the **design structure matrix** (DSM) is applied, ... The **genetic operator** such as selection operator, crossover operator and ...

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**DSM Web** - the online portal for the **Design Structure Matrix** Community.  
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A Dependency Structure Matrix, or DSM (also referred to as Dependency Structure Method, **Design Structure Matrix**, Problem Solving Matrix (PSM), ...

[en.wikipedia.org/wiki/Dependency\\_Structure\\_Matrix](http://en.wikipedia.org/wiki/Dependency_Structure_Matrix) - 16k - [Cached](#) - [Similar pages](#)

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**Design Structure Matrix**. DSM. A method for analysing dependencies in ...

**Design structure matrix**: Component Based, Physical Interfaces ...

[www.machine.ikp.liu.se/edu/under/tmkt31/CourseMaterial/Fo8/Design%20Structure%20Matrix.pdf](http://www.machine.ikp.liu.se/edu/under/tmkt31/CourseMaterial/Fo8/Design%20Structure%20Matrix.pdf) - [Similar pages](#)

### Using the Design Structure Matrix to Manage Product Development ...

**The Design Structure Matrix (DSM)** is a tool that maps information flow and its impact in product development processes. DSM represents visually the network ...  
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"design structure matrix" for a time-based matrix akin to a ... **design structure matrix** in construction," in 3rd Int. Workshop on Lean ...  
[ieeexplore.ieee.org/iel5/17/20485/00946528.pdf?arnumber=946528](http://ieeexplore.ieee.org/iel5/17/20485/00946528.pdf?arnumber=946528) - [Similar pages](#)

### IngentaConnect Product configuration analysis with design ...

The purpose of this paper is to introduce a method of how to analyse sales configuration models by using a **design structure matrix** (DSM) tool. ...  
[www.ingentaconnect.com/content/mcb/029/2006/00000106/00000007/art00005](http://www.ingentaconnect.com/content/mcb/029/2006/00000106/00000007/art00005) - [Similar pages](#)

### Design Structure Matrix (manAmplified)

The **Design Structure Matrix** can be used for system analysis and project management. Here is a good introduction. DSM is the basis for the concepts in Design ...  
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### [PDF] Analysis of the Design Structure Matrix: Complexity and Algorithms

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development projects; this is the **Design Structure Matrix** (DSM) approach. ... Steward (1981) introduced the notion of a **Design Structure Matrix** (DSM) which ...  
[www.cba.ufl.edu/dis/docs/papers/ProjectsWithSequentialIteration.pdf](http://www.cba.ufl.edu/dis/docs/papers/ProjectsWithSequentialIteration.pdf) - [Similar pages](#)

### Using the Design Structure Matrix (DSM) for Process Integration ...

The new standards advocate integrated engineering processes. A process is a kind of

system. As such, it derives its added value from the relationships among ...  
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[PDF] [Microsoft PowerPoint - Keith Woodman](#) [Vincent Bilardo Jr.](#)

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Introduce **Design Structure Matrix** (DSM) methodology. 2. Present a Practical Application of DSM in ... Introduction to **Design Structure Matrix** Methodology ...

pmchallenge.gsfc.nasa.gov/.../Day%201/ToolTimel/Keith%20Woodman\_%20Vincent%20Bilardo%20Jr.pdf - [Similar pages](#)

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### Workshop on Parameter Setting in Genetic and Evolutionary ...

Finally, the **genetic operator** configurations the meta-GA evolves are far from ... The methodology is demonstrated using the **dependency structure matrix** ...  
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### [PS] A Survey of Linkage Learning Techniques in Genetic and ...

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1999a), or linkage evolving **genetic operator** (LEGO) (Smith & Fogarty, 1995; Smith & Fogarty, ... **Dependency structure matrix** analysis: Off-line utility of ...  
<ftp://ftp-illigal.ge.uiuc.edu/pub/papers/IlliGALs/2007014.ps.Z> - [Similar pages](#)

### [PS] Extending the Scalability of Linkage Learning Genetic Algorithms ...

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**Genetic operator:** The inversion operator and the partially mapped ... sign inspired by organizational theory: Pilot study of a **dependency structure matrix** ...  
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### Methods and program products for optimizing problem clustering ...

Another example is **dependency structure matrix** ("DSM") models. ... [0027] It has been discovered that methods of applying a **genetic operator** to a parent DSM ...  
[www.freepatentsonline.com/20050177351.html](http://www.freepatentsonline.com/20050177351.html) - 70k - [Cached](#) - [Similar pages](#)

### [PDF] A Survey of Linkage Learning Techniques in Genetic and ...

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<nclab.tw/TR/2007/NCL-TR-2007009.pdf> - Supplemental Result - [Similar pages](#)

### [PDF] Introducing Recombination with Dynamic Linkage Discovery to ...

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**genetic operator** with linkage concept. To achieve this goal, ... inspired by organizational theory: Pilot study of a **dependency structure matrix** ...  
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### Methods and program products for optimizing problem clustering ...

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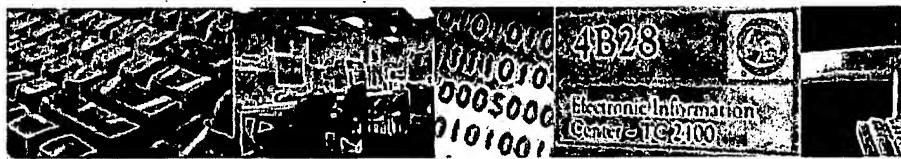
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1. **An Approach to the Application of the Design Structure Matrix for Assessing Reconfigurability of Distributed Manufacturing Systems**

Farid, A.M.; McFarlane, D.C.; [Distributed Intelligent Systems: Collective Intelligence and Its Applications, 2006 IEEE Workshop on](#)

15-16 June 2006 Page(s):121 - 126  
Digital Object Identifier 10.1109/DIS.2006.10

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2. **Applying the design structure matrix to system decomposition and integration: a review and new directions**

Browning, T.R.; [Engineering Management, IEEE Transactions on](#)  
Volume 48, Issue 3, Aug. 2001 Page(s):292 - 306  
Digital Object Identifier 10.1109/17.946528

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3. **Information Leaders in Product Development Organizational Networks: System Analysis of the Design Structure Matrix**

Batallas, D.A.; Yassine, A.A.; [Engineering Management, IEEE Transactions on](#)  
Volume 53, Issue 4, Nov. 2006 Page(s):570 - 582  
Digital Object Identifier 10.1109/TEM.2006.883706

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Soo-Haeng Cho; Eppinger, S.D.; [Engineering Management, IEEE Transactions on](#)  
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Digital Object Identifier 10.1109/TEM.2005.850722

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Linyi Deng; Yan Lin; Chaoguang Jin; Ming Chen; Qianwen You;  
Intelligent Control and Automation, 2006. WCICA 2006. The Sixth World Congr  
Volume 2, 21-23 June 2006 Page(s):7395 - 7399  
Digital Object Identifier 10.1109/WCICA.2006.1714523  
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Abdelsalam, H.M.E.; Bao, H.P.;  
Engineering Management, IEEE Transactions on  
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- 7. Enterprise Knowledge Based Database for New Product Development process**  
K. M. Tham; S. A. Sharif; B. Kayis;  
Management of Innovation and Technology, 2006 IEEE International Conference on  
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Digital Object Identifier 10.1109/ICMIT.2006.262198  
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Lu-ning Xu; He-ming Zhang; Wen-sheng Xu; Yong-kang Zhang;  
Computer Supported Cooperative Work in Design, 2005. Proceedings of the N  
Conference on  
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Yao Yong; Xiong Guangleng; Fan Wenhui; Fan Xiaodong;  
Networking, Sensing and Control, 2004 IEEE International Conference on  
Volume 1, 21-23 March 2004 Page(s):412 - 417 Vol.1  
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Bilalis, N.; Maravelakis, E.; Antoniadis, A.; Moustakis, V.;  
Engineering Management Conference, 2004. Proceedings. 2004 IEEE Interna  
Volume 3, 18-21 Oct. 2004 Page(s):1018 - 1022 Vol.3  
Digital Object Identifier 10.1109/EMC.2004.1408845  
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- 11. Managing unmanned flight projects using methods in complex product development**  
Mohan, S.N.;  
Aerospace Conference Proceedings, 2002. IEEE  
Volume 7, 9-16 March 2002 Page(s):7-3473 - 7-3488 vol.7  
Digital Object Identifier 10.1109/AERO.2002.1035324  
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Sabbaghian, N.; Eppinger, S.; Murman, E.;  
Systems, Man, and Cybernetics, 1998. 1998 IEEE International Conference on

Volume 3, 11-14 Oct. 1998 Page(s):2664 - 2669 vol.3

Digital Object Identifier 10.1109/ICSMC.1998.725062

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13. **Engineering design management: an information structure approach**

Yassine, A.;

[Innovation in Technology Management - The Key to Global Leadership. PICMI International Conference on Management and Technology](#)

27-31 July 1997 Page(s):483

Digital Object Identifier 10.1109/PICMET.1997.653479

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14. **An analytical method based on design structure matrix for modular ident**

Xiaogang, X.; Chao, L.; Jian, Y.; Yahua, C.;

[Computer-Aided Industrial Design and Conceptual Design, 2006. CAIDCD '06. Conference on](#)

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Bo Yang; Xiangbo Ze; Lunling Liu;

[Computer Supported Cooperative Work in Design, 10th International Conference on](#)

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[Machine Learning and Cybernetics, 2006 International Conference on](#)

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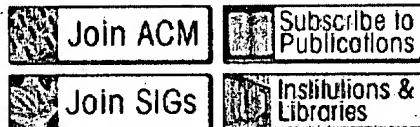
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**1 An analysis of modularity in aspect oriented design**

 Cristina Videira Lopes, Sushil Krishna Bajracharya

March 2005 **Proceedings of the 4th international conference on Aspect-oriented software development AOSD '05**

**Publisher:** ACM Press

Full text available:  [pdf\(474.39 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present an analysis of modularity in aspect oriented design using the theory of modular design developed by Baldwin and Clark [10]. We use the three major elements of that theory, namely: i) Design Structure Matrix (DSM), an analysis and modeling tool; ii) Modular Operators, units of variations for design evolution; and iii) Net Options Value (NOV), a quantitative approach to evaluate design. We study the design evolution of a Web Services application where we observe the effects of applying ...

**Keywords:** aspect oriented programming and design, design space matrix, modularity, net options value

**2 Logistics, transportation, and distribution: supply chain II: Earth to orbit logistics and supply chain modeling and simulation for NASA exploration systems**



Mohamed Fayed, Dayana Cope, Assem Kaylani, Mike Callinan, Edgar Zapata, Mansooreh Mollaghaseemi

December 2006 **Proceedings of the 38th conference on Winter simulation WSC '06**

**Publisher:** Winter Simulation Conference

Full text available:  [pdf\(334.43 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

As exploration operations expand further into space, NASA must enhance its understanding and capability of the increasingly complex "supply chain" management of materials, people, information, and knowledge from sources (somewhere on Earth) to destinations (somewhere in space, e.g. LEO, GEO, Moon, Mars, etc.) and vice versa. Without the ability to understand, define, model, and simulate the supply chain to estimate, project, and affect decision making relevant to the supply chain performance, NA ...

**3 The structure and value of modularity in software design**



 Kevin J. Sullivan, William G. Griswold, Yuanfang Cai, Ben Hallen

September 2001 **ACM SIGSOFT Software Engineering Notes , Proceedings of the 8th**

**European software engineering conference held jointly with 9th ACM SIGSOFT international symposium on Foundations of software engineering ESEC/FSE-9, Volume 26 Issue 5**

**Publisher:** ACM Press

Full text available: [pdf\(118.13 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The concept of information hiding modularity is a cornerstone of modern software design thought, but its formulation remains casual and its emphasis on changeability is imperfectly related to the goal of creating added value in a given context. We need better explanatory and prescriptive models of the nature and value of information hiding. We evaluate the potential of a new theory---developed to account for the influence of modularity on the evolution of the computer industry---to inform softwa ...

**Keywords:** design structure matrix, modularity, real options, software

**4** Ontologies in simulation: ontologies in simulation: Ontologies for supply chain simulation modeling 

Mohamed Fayed, Luis Rabelo, Mansooreh Mollaghazemi

December 2005 **Proceedings of the 37th conference on Winter simulation WSC '05**

**Publisher:** Winter Simulation Conference

Full text available: [pdf\(411.61 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Simulation might be an effective decision support tool in supply chain management. The review of supply chain simulation modeling methodologies revealed some issues one of which is the practicability of simulation in the supply chain environment. The supply chain environment is dynamic, information intensive, geographically dispersed, and heterogeneous. In order to develop usable supply chain simulation models, the models should be feasibly applicable in the supply chain environment. Distributed ...

**5** Using dependency models to manage complex software architecture 

 Neeraj Sangal, Ev Jordan, Vineet Sinha, Daniel Jackson

October 2005 **ACM SIGPLAN Notices , Proceedings of the 20th annual ACM SIGPLAN conference on Object oriented programming, systems, languages, and applications OOPSLA '05, Volume 40 Issue 10**

**Publisher:** ACM Press

Full text available: [pdf\(645.78 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An approach to managing the architecture of large software systems is presented. Dependencies are extracted from the code by a conventional static analysis, and shown in a tabular form known as the 'Dependency Structure Matrix' (DSM). A variety of algorithms are available to help organize the matrix in a form that reflects the architecture and highlights patterns and problematic dependencies. A hierarchical structure obtained in part by such algorithms, and in part by input from the user, then b ...

**Keywords:** DSM, architecture, dependency, matrix, model

**6** Regular posters (non-student): Software cultivation using the artificial intelligence design framework 

 Varadraj Gurupur, Urcun J Tanik

March 2006 **Proceedings of the 44th annual Southeast regional conference ACM-SE**

**44**

**Publisher:** ACM Press

Full text available: [pdf\(132.50 KB\)](#) Additional Information: [full citation](#), [abstract](#)

All along the history of software engineering, traditional software development process has always been a labor intensive process. This is perhaps because we are still in the preliminary evolutionary stage of software production where the software has to be built by a group of software developers either from scratch or by combining and/or reusing the components that have already been developed. In this paper we propose a unique method of building software in a way that is analogous to the growth ...

**7 Software engineering II: Crosscutting score: an indicator metric for aspect orientation** 

 Subhajit Datta

March 2006 **Proceedings of the 44th annual Southeast regional conference ACM-SE 44**

**Publisher:** ACM Press

Full text available:  pdf(225.53 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Aspect Oriented Programming (AOP) provides powerful techniques for modeling and implementing enterprise software systems. To leverage its full potential, AOP needs to be perceived in the context of existing methodologies such as Object Oriented Programming (OOP). This paper addresses an important question for AOP practitioners - how to decide whether a component is best modeled as a class or an aspect? Towards that end, we present an indicator metric, the *Crosscutting Score* and a method f ...

**Keywords:** analysis, aspects, design, metrics

**8 Modeling methodology: Extreme modeling: modeling design development in unpredictable environments** 

Nuno Gil, Iris D. Tommelein, Robert Kirkendall

December 2001 **Proceedings of the 33rd conference on Winter simulation WSC '01**

**Publisher:** IEEE Computer Society

Full text available:  pdf(467.77 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents a process simulation model representative for design development of a building system in an unpredictable environment. Unpredictability means that design criteria are prone to change as design development unfolds. The model was implemented with a discrete-event simulation engine based on event graphs. Events capture moments when tasks start or end, or changes that cancel future scheduled events and schedule new design iterations. Between conceptualization and concept developm ...

**9 Project management: Monitoring GSD projects via shared mental models: a suggested approach** 

Matthew Bass

May 2006 **Proceedings of the 2006 international workshop on Global software development for the practitioner GSD '06**

**Publisher:** ACM Press

Full text available:  pdf(213.38 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Team cognition research suggests that the degree to which teams have developed shared mental models is a significant factor in the performance of the team. Research in the software development domain has similar findings. This research is not, however, reflected in most commonly used project management practices. In geographically distributed software (GSD)development difficulty with team coordination is the norm. This paper looks at these issues, the research into team mental models, and sugges ...

**Keywords:** global software development, project management, shared mental models

10 Program understanding: A dynamic analysis for revealing object ownership and sharing

 Derek Ryside, Lucy Mendel, Daniel Jackson  
May 2006 **Proceedings of the 2006 international workshop on Dynamic systems analysis WODA '06**

**Publisher:** ACM Press

Full text available:  [pdf\(271.22 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a dynamic analysis for inferring object ownership and sharing, defined in terms of the *write control graph*. We render the results in an interactive hierarchical matrix visualizer. The purpose of the analysis and visualization is to reveal object ownership and sharing relations in the program, to facilitate program understanding and modification tasks.

**Keywords:** design extraction, dynamic analysis, ownership inference, software visualization

11 Bridging the gap between technical and social dependencies with Ariadne

 Erik Trainer, Stephen Quirk, Cleidson de Souza, David Redmiles  
October 2005 **Proceedings of the 2005 OOPSLA workshop on Eclipse technology eXchange eclipse '05**

**Publisher:** ACM Press

Full text available:  [pdf\(312.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

One of the reasons why large-scale software development is difficult is the number of dependencies that software engineers need to face; e.g., dependencies among the software components and among the development tasks. These dependencies create a need for communication and coordination that requires continuous effort by software developers. Empirical studies, including our own, suggest that technical dependencies among software components create social dependencies among the software developers ...

**Keywords:** collaborative software development, program dependencies, social dependencies

12 Short papers 1: Simon: modeling and analysis of design space structures

 Yuanfang Cai, Kevin J. Sullivan  
November 2005 **Proceedings of the 20th IEEE/ACM international Conference on Automated software engineering ASE '05**

**Publisher:** ACM Press

Full text available:  [pdf\(519.79 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The structure of the coupling relation on design decisions is a key factor influencing the evolvability properties and the economic value of a design. The work of Baldwin and Clark is an important step toward a theory of the relationship between structure and value. A key step to enabling rigorous validation and perhaps the eventual use of their ideas for software engineering is formalization of their model. In this paper, we present a brief overview of such a formal model and a prototype softwa ...

**Keywords:** dependence, design rule, design structure matrix

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1 [Search-based software engineering: posters: Single and multi-objective genetic operators in object-oriented conceptual software design](#)

C. L. Simons, I. C. Parmee

 July 2006 **Proceedings of the 8th annual conference on Genetic and evolutionary computation GECCO '06**
**Publisher:** ACM Press

 Full text available: [pdf\(307.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This poster paper investigates the potential of single and multi-objective genetic operators with an object-oriented conceptual design space. Using cohesion as an objective fitness function, genetic operators inspired by genetic algorithms and evolutionary programming are compared against a simple case study. Also, using both cohesion and coupling as objective fitness functions, multi-objective genetic operators inspired by a non-dominated sorting algorithm have been developed. Cohesion and coup ...

**Keywords:** evolutionary algorithms, object-oriented design, search

2 [GENOCOP: a genetic algorithm for numerical optimization problems with linear constraints](#)

Z. Michalewicz, C. Z. Janikow

 December 1996 **Communications of the ACM**
**Publisher:** ACM Press

 Full text available: [pdf\(250.33 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

3 [PSGEA contributions: Investigations in meta-GAs: panaceas or pipe dreams?](#)

Jeff Clune, Sheni Goings, Bill Punch, Eric Goodman

 June 2005 **Proceedings of the 2005 workshops on Genetic and evolutionary computation GECCO '05**
**Publisher:** ACM Press

 Full text available: [pdf\(249.39 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A meta-GA (GA within a GA) is used to investigate evolving the parameter settings of genetic operators for genetic and evolutionary algorithms (GEA) in the hope of creating a self-adaptive GEA. We report three findings. First, the meta-GA can adapt its genetic operators to different problems and thereby perform well on average across diverse

problems. Second, the meta-GA can change its parameters during the course of a run—seemingly a good idea—but this behavior may actually decrease ...

**Keywords:** adaptive parameter control, genetic algorithms, meta-GA

**4 Genetic algorithms: Applying price's equation to survival selection**

 Jeffrey K. Bassett, Mitchell A. Potter, Kenneth A. De Jong  
June 2005 **Proceedings of the 2005 conference on Genetic and evolutionary computation GECCO '05**

**Publisher:** ACM Press

Full text available:  [pdf\(196.61 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Several researchers have used Price's equation (from biology theory literature) to analyze the various components of an Evolutionary Algorithm (EA) while it is running, giving insights into the components contributions and interactions. While their results are interesting, they are also limited by the fact that Price's equation was designed to work with the averages of population fitness. The EA practitioner, on the other hand, is typically interested in the best individuals in the population, n ...

**Keywords:** price's equation

**5 Genetic algorithms for non-linear adaptive filters in digital signal processing**

 André Neubauer  
February 1996 **Proceedings of the 1996 ACM symposium on Applied Computing SAC '96**

**Publisher:** ACM Press

Full text available:  [pdf\(332.72 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** adaptive filter, genetic algorithm, on-line adaptation, parameter estimation, stochastic signal estimation

**6 Application of genetic algorithms to the algebraic simplification of tensor polynomials**

 M. Kavian, R. G. McLenaghan, K. O. Geddes  
July 1997 **Proceedings of the 1997 international symposium on Symbolic and algebraic computation ISSAC '97**

**Publisher:** ACM Press

Full text available:  [pdf\(1.09 MB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

**7 A sparse matrix representation for production scheduling using genetic algorithms**

 Simon J. T. Liang, John M. Lewis  
February 1995 **Proceedings of the 1995 ACM symposium on Applied computing SAC '95**

**Publisher:** ACM Press

Full text available:  [pdf\(579.43 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** genetic algorithms, job shop scheduling, representing

8 Adaptive feedback compensation for distributed load-based routing systems in datagram packet-switched communications networks



Arthur S. Olsen

July 1997 **ACM SIGCOMM Computer Communication Review**, Volume 27 Issue 3

**Publisher:** ACM Press

Full text available: [pdf\(2.60 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Routing systems for datagram packet-switched networks' iteratively applying Shortest Path First (SPF) algorithms on load-based link cost metrics exhibit poor stabilization and convergence properties at moderate traffic loads without the addition of experimentally determined Bertsekas Additive Bias Factors to aid in damping undesirable oscillations.

Routing systems which iteratively apply SPF Algorithms on load-varying link costs implicitly assume routing assignments can be independently modified ...

9 Reproductive adaptive plans



Daniel J. Cavigchio

August 1972 **Proceedings of the ACM annual conference - Volume 1 ACM'72**

**Publisher:** ACM Press

Full text available: [pdf\(1.05 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper traces the experimental development of a new class of powerful and flexible adaptive plans, called reproductive plans. Adaptive plans are formally presented as search procedures for locating superior devices in an extremely large space. Reproductive adaptive plans operate by treating the search procedure as an evolutionary process of finding the best organism in a certain environment. Devices are represented as strings or chromosomes. At each "generation" or time step ...

**Keywords:** Adaptation, Adaptive plans, Adaptive search, Adaptive systems, Artificial intelligence, Evolution, Heuristic search, Learning, Pattern recognition, Reproductive adaptive plans, Search procedures

10 Biological applications: A GA for maximum likelihood phylogenetic inference using neighbour-joining as a genotype to phenotype mapping



Leon Poladian

June 2005 **Proceedings of the 2005 conference on Genetic and evolutionary computation GECCO '05**

**Publisher:** ACM Press

Full text available: [pdf\(239.66 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Evolutionary relationships among species can be represented by a phylogenetic tree and inferred by optimising some measure of fitness, such as the statistical likelihood of the tree (given a model of the evolutionary process and a data set). The combinatorial complexity of inferring the topology of the best tree makes phylogenetic inference ideal for genetic algorithms. In this paper, two existing algorithms for phylogenetic inference (neighbour-joining and maximum likelihood) are co-utilised wi ...

**Keywords:** genetic algorithms, genotype to phenotype mapping, maximum likelihood, neighbour joining, phylogenetic inference

11 VLSI cell placement techniques



K. Shahaokar, P. Mazumder

June 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(5.28 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

VLSI cell placement problem is known to be NP complete. A wide repertoire of heuristic algorithms exists in the literature for efficiently arranging the logic cells on a VLSI chip. The objective of this paper is to present a comprehensive survey of the various cell placement techniques, with emphasis on standard cell and macro placement. Five major algorithms for placement are discussed: simulated annealing, force-directed placement, min-cut placement, placement by numerical optimization, a ...

**Keywords:** VLSI, floor planning, force-directed placement, gate array, genetic algorithm, integrated circuits, layout, min-cut, physical design, placement, simulated annealing, standard cell

**12** [Modeling methodology: A framework for distributed simulation optimization](#) 

Björn Gehlsen, Bernd Page

December 2001 **Proceedings of the 33nd conference on Winter simulation WSC '01**

**Publisher:** IEEE Computer Society

Full text available:  pdf(349.11 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The system presented bridges the gap between three different research areas: discrete event simulation, heuristic optimization methods and distributed systems technology. Its goal is to provide a framework which supports an efficient implementation of simulation optimization projects, including heuristic optimum seeking procedures and parallel execution of experiments. It is written completely in Java and only uses components that are publicly available, including software libraries from academi ...

**13** [An updated survey of GA-based multiobjective optimization techniques](#) 

 Carlos A. Coello

June 2000 **ACM Computing Surveys (CSUR)**, Volume 32 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(250.77 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

After using evolutionary techniques for single-objective optimization during more than two decades, the incorporation of more than one objective in the fitness function has finally become a popular area of research. As a consequence, many new evolutionary-based approaches and variations of existing techniques have recently been published in the technical literature. The purpose of this paper is to summarize and organize the information on these current approaches, emphasizing the importanc ...

**Keywords:** artificial intelligence, genetic algorithms, multicriteria optimization, multiobjective optimization, vector optimization

**14** [Enhancing information retrieval by automatic acquisition of textual relations using genetic programming](#) 

 Agneta Bergström, Patricija Jaksetic, Peter Nordin

January 2000 **Proceedings of the 5th international conference on Intelligent user interfaces IUI '00**

**Publisher:** ACM Press

Full text available:  pdf(633.96 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We have explored a novel method to find textual relations in electronic documents using genetic programming and semantic networks. This can be used for enhancing information

retrieval and simplifying user interfaces. The automatic extraction of relations from text enables easier updating of electronic dictionaries and may reduce interface area both for search input and hit output on small screens such as cell phones and PDAs (Personal Digital Assistants).

**Keywords:** genetic programming, information retrieval, machine learning, natural language processing, semantic networks

15 Genetic list scheduling algorithm for scheduling and allocation on a loosely coupled heterogeneous multiprocessor system



Martin Grajcar

June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation DAC '99**

**Publisher:** ACM Press

Full text available: [pdf\(134.04 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** genetic algorithms, heterogeneous system design, heuristic, list scheduling

16 A genetic programming system for the induction of iterative solution algorithms to novice procedural programming problems

Nelishia Pillay

July 2005 **Proceedings of the 2005 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries SAICSIT '05**

**Publisher:** South African Institute for Computer Scientists and Information Technologists

Full text available: [pdf\(135.01 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The study presented in this paper evaluates genetic programming (GP) as a means of evolving solution algorithms to novice iterative programming problems. This research forms part of a study aimed at reducing the costs associated with developing intelligent programming tutors by inducing solutions to the programming problems presented to students, instead of requiring the lecturer to provide these solutions. The paper proposes a GP system for the induction of algorithms using iteration and nested ...

**Keywords:** automatic programming, genetic programming, intelligent programming tutors

17 Applications in logistics, transportation, and distribution: Manufacturing supply chain applications 1: supply chain multi-objective simulation optimization

Jeffrey A. Joines, Deepak Gupta, Mahmut Ali Gokce, Russell E. King, Michael G. Kay

December 2002 **Proceedings of the 34th conference on Winter simulation: exploring new frontiers WSC '02**

**Publisher:** Winter Simulation Conference

Full text available: [pdf\(177.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

A critical decision companies are faced with on a regular basis is the ordering of products and/or raw materials. Poor decisions can lead to excess inventories that are costly or to insufficient inventory that cannot meet its customer demands. These decisions may be as simple as "How much to order" or "How often to order" to more complex decision forecasting models. This paper addresses optimizing these sourcing decisions within a supply chain to determine robust solutions. Utilizing an exist ...

18 An evolution programming approach on multiple behaviors for the design of application specific programmable processors

Wei Zhao, C. A. Papachristou

March 1996 **Proceedings of the 1996 European conference on Design and Test EDTC '96**

Publisher: IEEE Computer Society

Full text available: .pdf(819.57 KB)

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This paper proposes an Evolution Programming Approach for behavior-level area-efficient design of ASPPs (Application Specific Programmable Processors). This approach, based on a given behavioral-level kernel, randomly transforms each of the input behaviors, then the behavioral kernel is used in the evolution process to guide the survival of data flow graphs (DFGs). Finally, instead of the given DFGs, the surviving DFGs are used to synthesize a programmable architecture. This leads to an area-eff ...

**Keywords:** DSP chips, application specific integrated circuits, application specific programmable processors, area-efficient design, behavior-level area-efficient design, behavioral kernel, circuit CAD, circuit layout CAD, data flow graphs, digital signal processing chips, evolution programming approach, high level synthesis, integrated circuit design, logic design, multiple behaviors, programmable architecture, programming

19 Convergence characteristics of keep-best reproduction

 Kay Wiese, Scott D. Goodwin

February 1999 **Proceedings of the 1999 ACM symposium on Applied computing SAC '99**

Publisher: ACM Press

Full text available: .pdf(792.06 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** convergence models, family competition, selection intensities, selection schemes

20 Using genetic algorithms to generate Steiner triple systems

 Stephen J. Hartley, Aaron H. Konstam

March 1993 **Proceedings of the 1993 ACM conference on Computer science CSC '93**

Publisher: ACM Press

Full text available: .pdf(748.43 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Steiner systems, particularly triple systems, are usually generated by mathematicians using techniques from the theory of groups and quasi-groups. When pencil-and-paper enumeration becomes infeasible, mathematicians have used computers to carry out exhaustive searches. This paper presents some results of using genetic algorithms, which do not use exhaustive search, to generate Steiner systems. A specialized mutation operator was effective in generating Steiner triple systems. Future research ...

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Relevance scale

1 [Search-based software engineering: posters: Single and multi-objective genetic operators in object-oriented conceptual software design](#)

C. L. Simons, I. C. Parmee

July 2006 **Proceedings of the 8th annual conference on Genetic and evolutionary computation GECCO '06**

**Publisher:** ACM Press

Full text available: [pdf\(307.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This poster paper investigates the potential of single and multi-objective genetic operators with an object-oriented conceptual design space. Using cohesion as an objective fitness function, genetic operators inspired by genetic algorithms and evolutionary programming are compared against a simple case study. Also, using both cohesion and coupling as objective fitness functions, multi-objective genetic operators inspired by a non-dominated sorting algorithm have been developed. Cohesion and coup ...

**Keywords:** evolutionary algorithms, object-oriented design, search

2 [GENOCOP: a genetic algorithm for numerical optimization problems with linear constraints](#)

Z. Michalewicz, C. Z. Janikow

December 1996 **Communications of the ACM**

**Publisher:** ACM Press

Full text available: [pdf\(250.33 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

3 [PSGEA contributions: Investigations in meta-GAs: panaceas or pipe dreams?](#)

Jeff Clune, Sheni Goings, Bill Punch, Eric Goodman

June 2005 **Proceedings of the 2005 workshops on Genetic and evolutionary computation GECCO '05**

**Publisher:** ACM Press

Full text available: [pdf\(249.39 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A meta-GA (GA within a GA) is used to investigate evolving the parameter settings of genetic operators for genetic and evolutionary algorithms (GEA) in the hope of creating a self-adaptive GEA. We report three findings. First, the meta-GA can adapt its genetic operators to different problems and thereby perform well on average across diverse

problems. Second, the meta-GA can change its parameters during the course of a run—seemingly a good idea—but this behavior may actually decrease ...

**Keywords:** adaptive parameter control, genetic algorithms, meta-GA

**4** Genetic algorithms: Applying price's equation to survival selection

 Jeffrey K. Bassett, Mitchell A. Potter, Kenneth A. De Jong  
June 2005 **Proceedings of the 2005 conference on Genetic and evolutionary computation GECCO '05**

**Publisher:** ACM Press

Full text available: .pdf(196.61 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Several researchers have used Price's equation (from biology theory literature) to analyze the various components of an Evolutionary Algorithm (EA) while it is running, giving insights into the components contributions and interactions. While their results are interesting, they are also limited by the fact that Price's equation was designed to work with the averages of population fitness. The EA practitioner, on the other hand, is typically interested in the best individuals in the population, n ...

**Keywords:** price's equation

**5** Genetic algorithms for non-linear adaptive filters in digital signal processing

 André Neubauer  
February 1996 **Proceedings of the 1996 ACM symposium on Applied Computing SAC '96**

**Publisher:** ACM Press

Full text available: .pdf(332.72 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** adaptive filter, genetic algorithm, on-line adaptation, parameter estimation, stochastic signal estimation

**6** Application of genetic algorithms to the algebraic simplification of tensor polynomials

 M. Kavian, R. G. McLenaghan, K. O. Geddes  
July 1997 **Proceedings of the 1997 international symposium on Symbolic and algebraic computation ISSAC '97**

**Publisher:** ACM Press

Full text available: .pdf(1.09 MB) Additional Information: [full citation](#), [references](#), [index terms](#)

**7** A sparse matrix representation for production scheduling using genetic algorithms

 Simon J. T. Liang, John M. Lewis  
February 1995 **Proceedings of the 1995 ACM symposium on Applied computing SAC '95**

**Publisher:** ACM Press

Full text available: .pdf(579.43 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** genetic algorithms, job shop scheduling, representing

8 Adaptive feedback compensation for distributed load-based routing systems in datagram packet-switched communications networks

 Arthur S. Olsen

July 1997 **ACM SIGCOMM Computer Communication Review**, Volume 27 Issue 3

**Publisher:** ACM Press

Full text available: .pdf(2.60 MB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Routing systems for datagram packet-switched networks' iteratively applying Shortest Path First (SPF) algorithms on load-based link cost metrics exhibit poor stabilization and convergence properties at moderate traffic loads without the addition of experimentally determined Bertsekas Additive Bias Factors to aid in damping undesirable oscillations. Routing systems which iteratively apply SPF Algorithms on load-varying link costs implicitly assume routing assignments can be independently modified ...

9 Reproductive adaptive plans

 Daniel J. Cacicchio

August 1972 **Proceedings of the ACM annual conference - Volume 1 ACM'72**

**Publisher:** ACM Press

Full text available: .pdf(1.05 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper traces the experimental development of a new class of powerful and flexible adaptive plans, called reproductive plans. Adaptive plans are formally presented as search procedures for locating superior devices in an extremely large space. Reproductive adaptive plans operate by treating the search procedure as an evolutionary process of finding the best organism in a certain environment. Devices are represented as strings or chromosomes. At each "generation" or time step ...

**Keywords:** Adaptation, Adaptive plans, Adaptive search, Adaptive systems, Artificial intelligence, Evolution, Heuristic search, Learning, Pattern recognition, Reproductive adaptive plans, Search procedures

10 Biological applications: A GA for maximum likelihood phylogenetic inference using neighbour-joining as a genotype to phenotype mapping

 Leon Poladian

June 2005 **Proceedings of the 2005 conference on Genetic and evolutionary computation GECCO '05**

**Publisher:** ACM Press

Full text available: .pdf(239.66 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Evolutionary relationships among species can be represented by a phylogenetic tree and inferred by optimising some measure of fitness, such as the statistical likelihood of the tree (given a model of the evolutionary process and a data set). The combinatorial complexity of inferring the topology of the best tree makes phylogenetic inference ideal for genetic algorithms. In this paper, two existing algorithms for phylogenetic inference (neighbour-joining and maximum likelihood) are co-utilised wi ...

**Keywords:** genetic algorithms, genotype to phenotype mapping, maximum likelihood, neighbour joining, phylogenetic inference

11 VLSI cell placement techniques

 K. Shahooor, P. Mazumder

June 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 2

**Publisher:** ACM Press

Full text available: .pdf(5.28 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

VLSI cell placement problem is known to be NP complete. A wide repertoire of heuristic algorithms exists in the literature for efficiently arranging the logic cells on a VLSI chip. The objective of this paper is to present a comprehensive survey of the various cell placement techniques, with emphasis on standard cell and macro placement. Five major algorithms for placement are discussed: simulated annealing, force-directed placement, min-cut placement, placement by numerical optimization, a ...

**Keywords:** VLSI, floor planning, force-directed placement, gate array, genetic algorithm, integrated circuits, layout, min-cut, physical design, placement, simulated annealing, standard cell

**12** Modeling methodology: A framework for distributed simulation optimization 

 Björn Gehlsen, Bernd Page

December 2001 **Proceedings of the 33nd conference on Winter simulation WSC '01**

**Publisher:** IEEE Computer Society

Full text available: .pdf(349.11 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The system presented bridges the gap between three different research areas: discrete event simulation, heuristic optimization methods and distributed systems technology. Its goal is to provide a framework which supports an efficient implementation of simulation optimization projects, including heuristic optimum seeking procedures and parallel execution of experiments. It is written completely in Java and only uses components that are publicly available, including software libraries from academi ...

**13** An updated survey of GA-based multiobjective optimization techniques 

 Carlos A. Coello

June 2000 **ACM Computing Surveys (CSUR)**, Volume 32 Issue 2

**Publisher:** ACM Press

Full text available: .pdf(250.77 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

After using evolutionary techniques for single-objective optimization during more than two decades, the incorporation of more than one objective in the fitness function has finally become a popular area of research. As a consequence, many new evolutionary-based approaches and variations of existing techniques have recently been published in the technical literature. The purpose of this paper is to summarize and organize the information on these current approaches, emphasizing the importanc ...

**Keywords:** artificial intelligence, genetic algorithms, multicriteria optimization, multiobjective optimization, vector optimization

**14** Enhancing information retrieval by automatic acquisition of textual relations using 

 genetic programming

Agneta Bergström, Patricia Jaksetic, Peter Nordin

January 2000 **Proceedings of the 5th international conference on Intelligent user interfaces IUI '00**

**Publisher:** ACM Press

Full text available: .pdf(633.96 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We have explored a novel method to find textual relations in electronic documents using genetic programming and semantic networks. This can be used for enhancing information

retrieval and simplifying user interfaces. The automatic extraction of relations from text enables easier updating of electronic dictionaries and may reduce interface area both for search input and hit output on small screens such as cell phones and PDAs (Personal Digital Assistants).

**Keywords:** genetic programming, information retrieval, machine learning, natural language processing, semantic networks

15 Genetic list scheduling algorithm for scheduling and allocation on a loosely coupled heterogeneous multiprocessor system



Martin Grajcar

June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation DAC '99**

**Publisher:** ACM Press

Full text available: [pdf\(134.04 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** genetic algorithms, heterogeneous system design, heuristic, list scheduling

16 A genetic programming system for the induction of iterative solution algorithms to novice procedural programming problems

Nelishia Pillay

July 2005 **Proceedings of the 2005 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries SAICSIT '05**

**Publisher:** South African Institute for Computer Scientists and Information Technologists

Full text available: [pdf\(135.01 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The study presented in this paper evaluates genetic programming (GP) as a means of evolving solution algorithms to novice iterative programming problems. This research forms part of a study aimed at reducing the costs associated with developing intelligent programming tutors by inducing solutions to the programming problems presented to students, instead of requiring the lecturer to provide these solutions. The paper proposes a GP system for the induction of algorithms using iteration and nested ...

**Keywords:** automatic programming, genetic programming, intelligent programming tutors

17 Applications in logistics, transportation, and distribution: Manufacturing supply chain applications 1: supply chain multi-objective simulation optimization

Jeffrey A. Joines, Deepak Gupta, Mahmut Ali Gokce, Russell E. King, Michael G. Kay

December 2002 **Proceedings of the 34th conference on Winter simulation: exploring new frontiers WSC '02**

**Publisher:** Winter Simulation Conference

Full text available: [pdf\(177.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

A critical decision companies are faced with on a regular basis is the ordering of products and/or raw materials. Poor decisions can lead to excess inventories that are costly or to insufficient inventory that cannot meet its customer demands. These decisions may be as simple as "How much to order" or "How often to order" to more complex decision forecasting models. This paper addresses optimizing these sourcing decisions within a supply chain to determine robust solutions. Utilizing an exist ...

18 An evolution programming approach on multiple behaviors for the design of application specific programmable processors

Wei Zhao, C. A. Papachristou

March 1996 **Proceedings of the 1996 European conference on Design and Test EDTC '96**

**Publisher:** IEEE Computer Society

Full text available: [pdf\(819.57 KB\)](#)

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Additional Information: [full citation](#), [abstract](#), [citations](#)

This paper proposes an Evolution Programming Approach for behavior-level area-efficient design of ASPPs (Application Specific Programmable Processors). This approach, based on a given behavioral-level kernel, randomly transforms each of the input behaviors, then the behavioral kernel is used in the evolution process to guide the survival of data flow graphs (DFGs). Finally, instead of the given DFGs, the surviving DFGs are used to synthesize a programmable architecture. This leads to an area-eff ...

**Keywords:** DSP chips, application specific integrated circuits, application specific programmable processors, area-efficient design, behavior-level area-efficient design, behavioral kernel, circuit CAD, circuit layout CAD, data flow graphs, digital signal processing chips, evolution programming approach, high level synthesis, integrated circuit design, logic design, multiple behaviors, programmable architecture, programming

19 Convergence characteristics of keep-best reproduction

 Kay Wiese, Scott D. Goodwin

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**Publisher:** ACM Press

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**Keywords:** convergence models, family competition, selection intensities, selection schemes

20 Using genetic algorithms to generate Steiner triple systems

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**Publisher:** ACM Press

Full text available: [pdf\(748.43 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Steiner systems, particularly triple systems, are usually generated by mathematicians using techniques from the theory of groups and quasi-groups. When pencil-and-paper enumeration becomes infeasible, mathematicians have used computers to carry out exhaustive searches. This paper presents some results of using genetic algorithms, which do not use exhaustive search, to generate Steiner systems. A specialized mutation operator was effective in generating Steiner triple systems. Future research ...

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